MISSOURI BOTANICAL GARDEN
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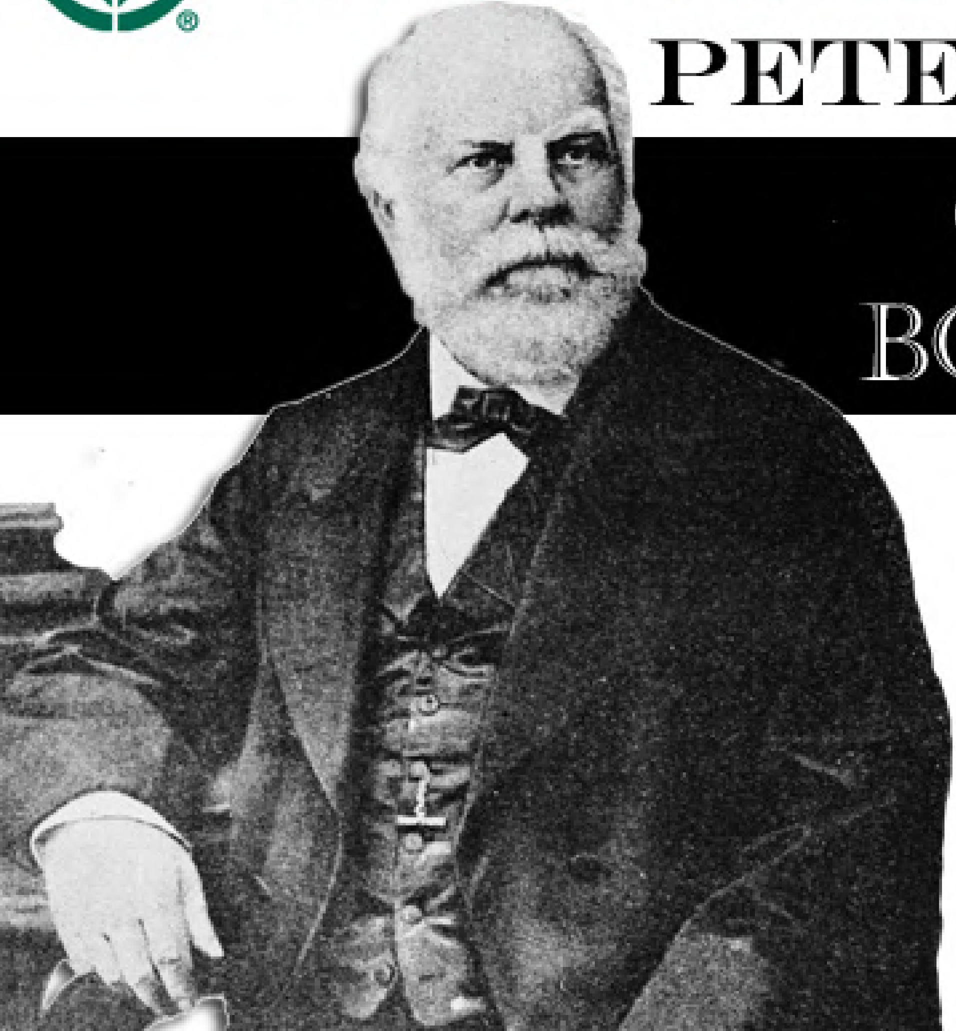
GEORGE ENGELMANN BOTANICAL NOTEBOOKS



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SHOUT
SHARE
IT

(the North American)

Notes on Callitriche. Mar. 1864

Callitriche ~~verna~~ Asagrayi, ♃. Fruit sessile or nearly so with a pair of bracts at its base.

Stems (very variable in length) often a foot or more long, much branched and rooting from near the base; leaves very variable as to shape and size, varying from round-obovate to awl shaped-linear, usually both sorts on the same plant, 3/4'' - 2½'' long by 1/3'' - 3'' wide in the widest place, which in the narrow sorts is at the base, and in the wider towards the apex, — in fact the leaf produced at the surface of the water and which at first is round obovate and about ¼' broad and ½' long usually gradually changes upon being submerged by the lengthening of the stem, losing in breadth and gaining in length, until it finally becomes ~~linear, or~~ awl-shaped-linear; ~~and~~ truncate and emarginate 2-toothed at the once entire and rounded apex!; and from 3/4' - 2½' long; not so bright green as in C. autumnalis, the base slightly dilated and clasping; all those produced at the surface of the water incompletely 3-5-nerved, the rest 1-nerved, the upper surface covered with scattered small circular depressions and the whole surface when dry appears to be covered with a transparent cellular coat.

Flowers monoicous or perfect; stamens 1''-6'' long; stigma thread-shaped 1''-2'' long: fruit small, nearly sessile, with a pair of colored bracts at its base, and with a characteristic plump appearance (which once observed serves to distinguish at a glance all the American forms of this species ~~the~~ as well as those from Asia), somewhat obcordate, varying from round obovate to orbicular and to roundish-ovate, usually flattish and thin (~~[illegible]~~ sometimes nearly terete) biconvex, deeply emarginate at the apex, slightly - often apparently not at all so at the base, ~~the outlet obtuse and broader~~ but ~~narrowly~~ and sharply keeled ~~on the back. (the keels somewhat conver-gent leaving the circumferential groove (of the fruit) to be usually very narrow and often indistinct while the longitudinal one is very distinct (the reverse of C. Autumnalis)~~;

~~[illegible]~~

~~seen sometimes of the same color as the third fruit~~) obovate-oblong, ~~broader~~ (widened) and thinner at the apex, narrowed and thicker at the ~~base~~ below, about 0.95 m.m long by 0.45 m.m broad, convex on the outer and plane on the inner surface. rounded but slightly and sharply ~~keeled~~ margined on the back by a membranaceous keel, which is an extension of the outer coating of the seed which resembles the outer coating of the stem and leaves (and is plainly a continuation of it) its depressions fitting into (those of) the closely reticulated and pitted nutlets. —

Includes many nominal species. C. heterophylla Pursh is the common form; C. tenuifolia Pursh, is a state with the leaves all produced under water and linear. (C. brevifolia Nutt.) C. terrestris Raf.! is a much condensed form from growing ~~on moist~~ ~~[illegible] the same as~~ ~~C. [illegible]folia~~ on mud.

Specimens from China, Japan,

the circumferential groove - on account of the convergence of the keels of the nutlets - very narrow, often rather indistinct, while the longitudinal one is very evident. (the converse of C. Autumnalis?)
Nutlets of the same color as dried plant, not readily separating.

Ecquador and Antarctic America all correspond with those from different parts of the U.S. excepting the last (~~[illegible] sterile~~), which (has thicker leaves and) is blackish as if it grew in brackish water, ~~[illegible]~~ but these ~~last~~ ~~speci~~ last specimens are sterile and it may belong to a different species.

0 1 2 3 4 5 6 7 8 9 10
cm
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BOTANICAL
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Callitriche autumnalis, L.

Stems 4'–8' long, often much branched and rooting from the joints below, striate, not fistulous(?) leafy.

Leaves all alike, 4"–8" long bright green, ~~finely striate under a lens~~, lanceolate-linear, constricted at the rounded clasping ~~the~~ concave base – the cavity containing the flowers, emarginate at the apex, the sinus crescent-shaped. distinctly but very finely striate under a lens (caused by the cells being arranged in linear rows end to end.) without impressed punctures somewhat hyaline on the extreme ~~border~~ margin which forms a slight curve from the base to the apex.

somewhat rounded

Flowers, bracteless monoicious (always?) Stamen very short. a little longer than the germ 1/2 the length of the stigmas; ~~germ sessile~~ stigmas thread-shaped, 3 times as long as the sessile germ, strongly deflexed immediately the ovules are fertilized.

Fruit inclining to orbicular almost imperceptibly longer than broad, thickish, on a very short, mostly indistinct peduncle,

slightly emarginate at the base, often indistinctly so, ~~and~~ more distinctly so at the apex, the surface plane inclining to concave, the longitudinal groove very indistinct, the circumferential groove deep, ~~and~~ broad, and angular; nutlets broader than in C. ~~verna~~ Asagrayi; thin, sharply and either narrowly or broadly keeled, the keels opaque and destitute of ribs or rays, diverging.

Habitat. St. Petersburg Russia and Berlin Prussia Dr Engelmann! — Germany Fries! — Scotland Arnott! — Lake Superior Loring! Lake James Brit Columbia Dr. Hooker! —

All the specimens I have seen from the above localities agree in every particular. No variation was observed except in the length of the stems and a slight difference in the size of the fruit which is from 1/2" — ~~[illegible]~~ to nearly 1" broad.

Stamens & stigmas not present except for a short time after the fertilization of the ovules.

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Callitriche [redacted] Engelmanni Sp. nov. — C. Engelhardt = vana C. F. Austin in Herb. Torr. &c.

C. planta minima; caulis ~~[illegible]~~ sesquiunciali prostrato ramoso; foliis minimis spathulato=ovatis vel=ellipticis indistincte trinerviis subcrassis secundis parte inferiore subverticalis, parte superiore horizontalis, fructu magis brevi vel distincte pedunculatis lato orbiculatis, basique apice aequaliter & profundeque emarginatis; achenis tenuis ovalis vel obovatis margine scleraceo-membranaceis acutis.—

Stems 1'-2' long, leafy and much branched, creeping and rooting at the joints; leaves 1"-2" long spatulo=ovate or =elliptical, thickish, indistinctly and imperfectly 3-nerved, secund, the narrow base erect and at right angles to the stem, the broad upper portion spreading horizontally (in a plane parallel to the stem), causing an abrupt bend and a ~~twist~~ in the narrow portion just where it begins to upwardly widen. Structure and shape of leaf much as in C. ~~[illegible]~~ Asagrayi.

Fruit bractless, black and shining when mature, ~~full~~ reticulated and

pitted; on a distinct peduncle usually about its own length, (never exceeding and often attaining to only half that length,) nearly orbicular though always a little wider than long, and very slightly wider above than below the middle, thin, with flat surfaces, deeply and equally emarginate at both base and apex; a very little the thicker below and the wider above; the groove around the circumference very narrow and deep; acutely angled; nutlets remarkably easy of separation 0.50 m.m. long by 0.35 m.m. broad, unequally oval (or ear-shaped) inclining to obovate; very thin, slightly convex on the inner, and plane on the outer surface; strongly and distinctly pitted, sharp on the back with an echinate membranous keel; (as in C. marginata when that fails to produce a wing) the outer membranous integument (as in C. peploides,) very indistinct and thin stamens and stigmas same length as fruit (0.50 m.m. long)

[redacted]

Hab. First detected on dry argillaceous soil on the high hills of Staten Island N.Y. in old byways in open woods where the ground was considerably descending, in June 1861 by the writer in company with Prof. F. A. Englehardt of N.Y. City. — Subsequently it was discovered to be very plenty in all the old byways on the Palisades ~~at~~ along the Hudson. Also in Dr. Torrey's Herbarium sparingly mixed with Nuttall's own specimens of C. peploides, from Ark. collected in 1814. — And from Ohio comm. by J. [illegible] Lea as "C. terrestris? Raf." And subsequently Dr. Engelmann has communicated specimens from Arkansas "covered with water in naked springy places on ~~prairies~~,

(Collected by himself also specimens from Memphis Tenn.: A. Fendler legit 20th May 1851.

Callitriche marginata Torr!

Stems prostrate, 2'-3' long, much branched and rooting at the joints, leafy; leaves spatulate, thinnish, covered with impressed punctures (Structure as in C. Asagrayi.) stamens 1/2' long; stigmas about the length of the fruit, at first spreading becoming recurved; fruit often several from the same axil, ~~without~~ bracts, very long peduncled, orbicular, much compressed and of an uniform thickness ~~throughout~~. strongly and equally emarginate at both the base and apex. deeply and rather narrowly grooved around the circumference: nutlets broadly winged or only strongly keeled on the back, 3/4ths, the very round. the the wing or keel membranaceous, pellucid, thickly studded with ray-like, stout, dark-colored ribs extending to the outer margin of the wing which is an extension of the membranous cuticle-like covering of the fruit, — the rays being an extension of the proper epicarp of the seeds. All ad-

= here rather firmly together, and when divested of the thick, whitish and strongly pitted coat which hides their true blackish color, and of the wing, they are about 0.95 m.m. long by 0.55 m.m. broad, plane on the inner and slightly convex on the outer surface; peduncle 2–6'' long, very broad ~~as broad as the lower portion of the leaf~~, (as broad as lower portion of the leaf.) ligulate, tapering upward, strongly 1-nerved, becoming declined after the fertilization of the ovules.

Fruit variable as to size and appearance, but these varieties are chiefly in the keel which is often as broad as the true nutlet, though sometimes only little more than a keel.

Hab. California! Whipple! in Fitch! in Herb. Torr. & N. Mexico Bigelow! in Herb. A. Gray.

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Nuttall

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Callitriche pedunculosa Nutt.
Trans. Amer. Phil. Soc. n. ser. vol.
5, p. 140!:— also in Herb. Torr.!

C. Nuttallii Torr. in Bot. Whipp. Exped.! ✓
(not C. pedunculata DC. nor C.
pedunculosa Arnott.)

Stems much branched 1'–3' long: leaves linear spatulate (more attenuate at the base than in C. marginata), thickish covered with impressed punctures: ~~flow~~ stamens ½'' long, slender: stigmas much longer than the fruit, deflexed from the beginning: fruit bractless, long-pedunculed, plainly broader than long, widest in the middle and of equal thickness ~~through out, (that is width plane~~ throughout, thickish, the longitudinal groove small the circumferential very broad and shallow} obtuse, the thickened keels strongly divergent clothed with a whitish membranaceous integument, but the true color of the nutlets when this is

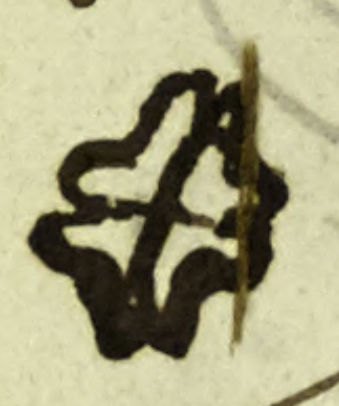
(Caused by the divergence of the keels)

removed is the same: Nutlets
0.80 m.m. long by 0.55 m.m. broad,
(broader in proportion to the length
than in the other species) not easily
separable, the inner surface plane,
the outer surface elevated in the
middle as well as again towards
the ~~[illegible]~~ keel, keel much
thickened, obtuse, pedicels
1''–3'' long, very slender, and
narrow (thread-shaped) declined after the fertilization
of the ovules and often burying
them beneath the surface of the
soil.

Hab. Arkansas Nutt! Texas Drummond!
~~Louisiana~~ Hale! – Carpenter!
(This plant is strangely mixed with
Nuttall's own specimens of C. peploides in ~~Dr. Torrey's~~ Herb. Torr.!)

Callitriche peploides Nutt. &c. N. 141!
and in Herb. Torr.!

Stems caespitose, usually strictly erect, 1-2' high; leaves very small, spatulate, thickish, indistinctly 3-nerved, closely punctured; stamen about the length of ripe fruit, stigmas (shorter than in any of the other species) shorter than the fruit, cylindrical ~~truncate~~ at apex, horizontally spreading; Fruit without bracts, very minute, sessile, black and shining when mature, broader than long, distinctly widened, thinner and broadly emarginate ~~notched~~ above, much narrowed, thicker and very narrowly emarginate ~~at the base~~ below; — a side view presents a broadly obcordate appearance but a vertical view a cruciately or stellately 4-lobed appearance, the lobes emarginate,



nutlets bent upward and twisted at the base so as to bring that portion ~~at~~ right angles to the upper portion giving to the fruit the peculiar appearance mentioned above.

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Nutlets very easily of separation as in C. Austinii ~~but~~ the fruit being covered with an extremely delicate cuticle, as in the above mentioned species.*

* When the cuticle is thick I have observed ~~that~~ the nutlets are correspondingly tenacious of each others society; — this is the case in C. Asagrayi — squamata — marginata and pedunculosa — they are equally easy of separation in C. ~~[illegible]~~ Engelmannii and C. neglecta.

Hab: Arkansas Nutt! — Louisiana,

Hab! Mexico L. C. Ervendberg

Opelousas Leavenworth! Texas

Wright! Galveston Island

Texas! Fend. Lindheimer legit

Dr. Engelmann Comm.

Very common in the Mississippi valley according to Nuttall, along fences and under the eaves of houses according to Leavenworth in Herb. Torr.

(Nuttalli specimens in Herb. Torr are mixed with both C. pedunculata & C. ~~[illegible]~~ Engelmannii!)

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Callitriche Questions ?

Have the plants of the terrestris section star-hairs or not

Are the "dots" or "punctation" the stomata, or what?

Have all the terrestrial section those single crystals in the parenchyma cells ?

And only the plants of that section ?

787

Reëxamine Call. "truncata" from Hannover.

Examine Stomata

Is the Embryo of all terrestris shorter than of the others, (Hegelm. C. deflexa

Have the submersed forms of Amphibious Callitriche stomata ?

r Engelman

Dear Sir

Inclosed you will
l fifty dollars left by Mrs
–, to pay you in full for what
ves you, You will please
– the receipt by the bearer,

Yours respectfully
Mrs P, M, House,

T. = Call. Herb = S.

U Hb. Short = Call. A. Gr. heterophylla microcarpa s. typica

V — — — — — ? no fruit seen.

W — — — — — ? or verna? no fruit
form submersa

X — — — — ! — — — — microcarpa

Y — — — — ! form heterophylla macrocarpa

Z. Hb Kew. Call — submersa setacea
fructibus perpaucis immaturis (steril?)

Aa — — — = Y

Bb. Hb Collins — — = U

Cc Hb Short — — forma brevifolia terrestris,
microcarpa

Dd. Acad Herb Call — — — —
subterrestris! macrocarpa

Ee Hb Short Call stagnalis? in fl. but no
fruit

form terrestris

Ff. Hb Dur. C. ~~hamulata~~ pedunculata ebracteata
fructibus subsessilibus

882

ALEX. LEITCH,

APOTHECARY & PHARMACEUTIST.

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.

A. Durand C. Engelmanni — } C. pedu[illegible]

B. " C. Nuttallii ~~Br[illegible]~~) [illegible] Ark

C. " C. Engelmanni —

D. " C. Nuttallii Brownish) Nuttall

E. Short C. ~~Nuttallii~~ Tor

F. " C. Engelmanni —

G. Arnd C. — — —
Bldr.

H. Dur. C. peploides (sessilis) [illegible] Loro

I. Dur C. — — — — " — Ark"
Natt

K. Short C ——— Hale La

L. — C ———

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

M. Arnd ½ slender C ——— ? } —
same
½ condensed C. Engelmanni ? } paper

N. Short C. autumnalis

O. Short C. autum —

P. Collins C. verna aquat. latifol. longistyl.

Q. Short C. verna terrestris

R. Arnd. C. — — broad winged.
(C. Engelm. [illegible] with it)

S. Collins — — —
(small spec no fruit cannot be named)

ALEX. LEITCH,
APOTHECARY & PHARMACEUTIST,
Marble Building Cor. Fourth & Olive Sts. S^t Louis, Mo.

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forma terrestris	natans	submersa
brevifolia Pursh	heterophylla Pursh	linearis Pursh
minima Hoppe	stellata Hoppe	angustifolia Hopp
caespitosa Schultz	intermedia Hopp.	autumnalis auct plur
		setacea Raf
		Reichb

Walp. Repertor 2. p. 100
refers Callitriche to Monocotyl
but never afterwards mentions them

Eucallitriche
amphibiae
Pseudocallitr.
terrestres
submersae

Callitriche Asae Grayi

macrocarpa, saepe subaristata, ad C. vernam transiens

heterophylla

linearis

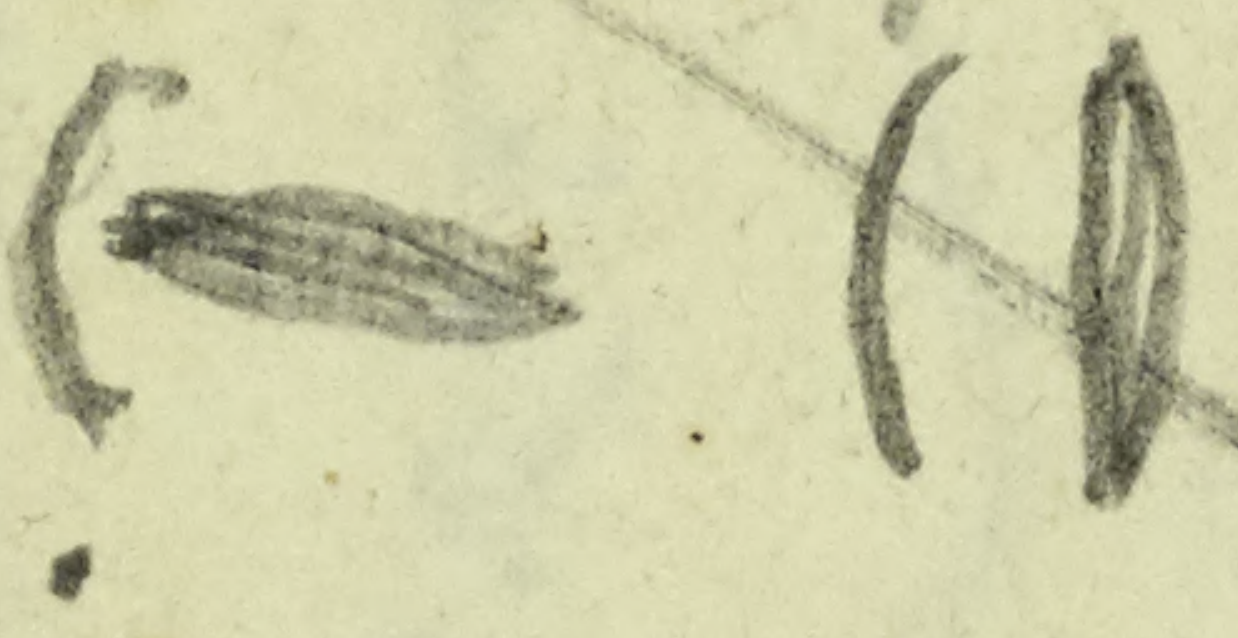
brevifolia

Westchester. Darlington HG Short.

Saco River Tuckerman HG Gray

Kentucky Short. HG Gr.

Sa



= Autumnalis

our flat = Actinomeris

Silphium obcompressed

Coreopsis compressed parallel with the sides of invol

obcompressed

Bidens —

Actinomeris laterally compressed

Helianthus "

Verbesina — "

(or only) compressed

Jan 13, 1865

Callitriche

790

spatulaefoliae
~~microphyllae~~

over

I Terrestres Isomorphae, ebracteatae, micrandrae filis abbreviat ~~brachyandrae~~, anther. transvers. ~~brachygynae~~ brevistylae, polycarpae, plerumque microcarpae plerumque crystallophorae & pollinis grana ~~minora~~ minora

	longit. anther.	diam. Pollen	~~latit.~~ fruct.	length
1. C. peploides Nutt.	0.3	0.016–0.020	0.5–7	0.4–5
2. C. microcarpa Eng	0.15 13	0.014–0.018	0.4	0.45
3. C. Japonica Eng	0.2	0.013–0.016	0.7	0.7
4. C. Austini Eng	0.2	0.017–0.020	0.7	0.5–6
5. C. deflexa Braun	0.2	0.017–0.019	0.9	0.7
? 6 C. marginata Torr	0.4 0.2–3	0.018–0.020 0.022–0.026	1.1–1.6	0.8–1.3
6 7. C. Nuttallii Torr	0.3	0.020–0.022	1.1 0.9–1.1	0.8 0.7–0.8
? 8. C. macropteryx Hegelm ?		?	1.4	1.2
? 9 C. occidentalis Hegelm.			1.3	1.2
7 10 C. turfosa Bert. (*Cape Horn species)	0.3	0.017–0.019 macrophyllae	0.8–0.9	0.7

II Amphibiae heteromorphae, bracteatae, macrandrae fil. elongat anth. transvers. longistylae, fructibus plerumque paucioribus, plerumque majoribus — pollinis grana majora.

11. Asa Grayi Hegelm	0.7–1.0 (Kentucky Short)	0.020–0.027	0.7–1.0	0.6–1.0
12. verna Lin	0.5–0.7	0.020–0.030 (16–19 × 25–28)	0.8–1.1	1.0–1.3
13. stagnalis Scop	0.5–0.8	0.025–0.030	1.3–1.5	1.3–1.7
14 Berteroniana Steud	0.5	0.025–0.030	var 1.0–1.1 var 2.0	0.9–1.1 1.7
15. hamulata Kütz	0.5	0.030–0.045	1.2–1.4	1.0–1.3
16 pedunculata DC.	0.4	0.020–0.026	1.0–1.3 1.1–1.3	1.0–1.3 1.1–1.4
17. heteropoda Eng	—	—	1.3	1.4
pedicellata	0.5	0.024–0.028	1.3	1.5
18 Antarctica Eng	1.1	0.024–0.031	1.1–1.4	1.1–1.3
19. obtusangula LeGall	0.6	0.022–0.028	1.0	1.1

III. Submersae Isomorphae, longifoliae ebracteatae, macrandrae ~~brachy~~ fil. brevissimis anth. deciduis ovatis & fructibus paucioribus, majoribus, longistylae, pollinis grana majora

20 truncata Guss	0.3?		1.1–1.2	1.1–1.2
21 autumnalis Lin	0.5	0.024–0.034 × 0.020–0.024 (0.020–0.024)	1.5–2.4	1.5–2.4

13 Jan

1. Terrestres

(glaberrimae ~~glabratae~~

~~Heteromorph~~ Isomorphae, spinulis foliorum microphyllae,

ebracteatae, antherae parvae transversae in filamentis non elongatis, persistentes; pollinis granula minuta; styli breves (excr. Nuttallii) fructus minimi excr. (No 6–9) saepe in parenchymatis cellulis crystallophori.

Anth. 0.13 – 0.40 mm in diamet.
Pollen 0.013 – 0.022 in diam.
fructus 0.4 – 0.9 in diam. et 0.4 – 0.7 alt
exc. No 6 & 9: 0.9 – 1.6 × 0.7 – 1.3

2. Amphibiae

(pilis squamiformibus plus minus distinctae

(raris ebracteatae Heteromorphae, heterophyllae

bracteatae, ~~fa~~ antherae magnae transversae in filamentis demum elongatis persistentes; pollinis granula majora styli ~~plerumque~~ longiores, fructus plerumque majores, maximive (excr. Asa Grayi (verna nec non) nunquam crystallophori

formae terrestres microphyllae, bracteatae s. ebracteatae, antherae steriles abortivae in filamentis nunquam elongatis, styli breviores.

formae submersae lorifoliae ebracteatae antherae ~~steriles~~ abortivae in filamentis nunquam elongatis

Anth 0.40 – 1.00 mm diamt.
Pollen 0.020 – 0.045 diam ~~long~~
fructus 1.0 – 2.0 diam trs. 0.9 – 1.7 alt
exc. No 11 & 12: 0.7 – 1.1 × 0.6 – 1.3

3. Submersae Isomorphae, lorifoliae

glaberrimae

ebracteatae, antherae magnae ovatae in filamentis nunquam elongatis mox deciduae; pollinis granula majora; styli longiores; fructus majores nunquam crystallophori.

anth 0.50
Poll 0.020 – 0.034
fruct 1.1 – 2.4 diam × 1.1 – 2.4 alt

Size of anthers of peploides,

Cryptanthe i Nuttallii?

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Jan 3^{d} 1865

lmann

$43.—

792

Crystals in Parenchyma of fruit

					mm
Callitr	microcarpa	large Engelm	$\frac{3-3\frac{1}{2}}{540}$	$\frac{6}{785}$	0.005 – 0.006 0.008
—	Austini	small. Engelm	$\frac{1-1\frac{1}{4}}{280}$	$\frac{2-2\frac{1}{2}}{540}$	0.003 – 0.005
—	deflexa	Hegelm. Engelm		$\frac{2-4}{540}$	0.004 – 0.007
—	macropteryx	Hegelm.			
—	peploides	small, Engelm	$\frac{3-4\frac{1}{2}}{780}$	$\frac{1\frac{1}{2}-2}{415}$	0.003 – 0.006
—	turfosa	Engelm $\frac{2-4}{540}$			0.004 – 0.007

Not present in

Callitr Japonica, verna, marginata stagnalis heterophylla

540 | 3000 | 0,005
270

540 | 3250 | 0.006
324

780 | 6000 | 0,008
624

0,008
28 | 100
84

0.004
28 | 125
112

0.004
54 | 200
216

0,005
54 250

54 | 200

54 | 400 | 0,007
378
22

0.0036
415 | 1500
1245
2550

4
415 | 2000

0.004
78 | 300
312

0.006
78 | 450
468

200

54 | 400 | 7

Leitch & Corliss
DRUGGISTS
South-West Corner Fifth and Market Streets

Sept 14

Callitrichae terrestres

ebracteatae pistillatis bisexualibus

~~axillis~~ polycarpeae (pauci)-andrae

1 C. peploides (Drummondii) } styli saepius abbreviati

2 C. Engelmanniana (deflexa var) } monomorphae polycarp. brevistylae

3 C. Nuttallii (deflexa) }

4? C. marginata Torr } C. macropteryx

5? C. pedunculata DC ? } C. [illegible] Holl Cuba

Callitriche amphibiae [natantes?]

bracteatae plantis elongatis

(axillae subhermaphroditae)

styli saepius elongati

dimorphae

floating (or on mud)

C. Asa Grayi 5

C. verna 4

C. stagnalis 2

C. hamulata 3

C. turfosa 1

Obtusangula

793

Callitriche submersae monomorphae

ebracteatae plantis brevibus

axillae monoicae

styli elongati

C. autumnalis

C. truncata

ALEX. LEITCH,
APOTHECARY & PHARMACEUTIST,
Marble Building Cor. Fourth & Olive Sts. St Louis, Mo.

1-121

Callitriche

794A

0 1 2 3 4 5 6 7 8 9 10
cm
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0 1 2 3 4 5 6 7 8 9 10
cm
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GARDEN

Rhamnus cathartica Lin.

Spreng I, 767
RoM II, 176

♄ Europa

In dumetis hinc inde Fr.
1826

Hegelmaier Callitriche
1867

794

no bracts	Crystals
C. Mulleri	C. Mulleri in part
turfosa *	turfosa !
deflexa *	deflexa !
peploides *	peploides !
Sonderi	Sonderi
occidentalis ?	
Nuttallii ?	

Bracts	no Crystals
marginata * !	marginata !
umbonata	umbonata
	occidentalis
	Nuttallii !

* with star scales

App. I p. 9 Mexico is mentioned as home of a Callitriche, but I find no other allusion to it and do not know to what species the author refers (April 1878

ENNO SANDER & CO.,
PHARMACEUTISTS,
Cor. 4th & Walnut, under Southern Hotel,
Cor. 2d & Walnut, under Barnum's Hotel,
ST. LOUIS, MO.

Vitis riparia

1, Leaves with long acumination and teeth also long acuminated.

a) Seeds obtuse above, very slender filiform suture

Chalaza oval-oblong, tuberculate, somewhat convex.

Taylor (berry greenish, brownish)

Chalaza depressed, concave

Flick wer ~~worth~~ (berry black)

b. Seed obcordate, suture almost none

Chalaza excavated

Delaware

2, Leaves with short teeth.

Chalaza orbicular, convex, seed obtuse

Clinton

Helderberg (at Soulards)

Hegelmaier 1867

* additions in Append II
1869

795

I Eucallitriche

a Cells of the keel or wing of the fruit with indurated and often netted ridges. Crystals often present filaments not elongated, bracts mostly wanting Mostly Landplants.

α. base of fruit not strumous

* Keels convergent

1. C. Mulleri Sonder (C. macropteryx Hegelm) New Holland

** Keels straight

*2. C. marginata Torr α, Torreyana β. Berteroana γ. Lechleri

* stenocarpa Heg
Califor

3. C. turfosa Bertero
4 C. occidentalis Hegelm. Cuba
5 C. deflexa Braun α. Brauniana β. Austini

* Japonica Engl
* brachycarpa Heg
Austral

***. Keels eversed

*6. C. Nuttallii Torr

β. base of fruit strumous

7. C. peploides Nutt (C. Drummondii Hegelm)

* microcarpa Eng
Cuba

*8 C. Sonderi Hegelm n. sp New Holland
*9. C. umbonata Hegelm n. sp. New Holl, Tasmania

b Cells of the keel without indurated ridges never crystals, filaments often elongated, bracts mostly present. Amphibious plants

α. edges of fruit rounded; stigm erect persistent

*10. C. antarctica Engelm.
*11 C. heteropoda Engelm (in appendix)
12 C. heterophylla Pursh (C Asa Grayi Hegelm)

* Bolanderi Heg
Calif

13 C. obtusangula Le Gall

β. edges of fruit keeled; stigma erect

14. C. verna L
15 C. stagnalis Scop

γ. stigm reflexed deciduous

16 C. hamulata Ktzg

* cyclocarpa Heg
N Holland

17. C. pedunculata DC

II Pseudocallitriche

18 C. autumnalis L
19 C. truncata Guss

6 species added 1867 and 6 in 1869 to the 13 in 1864 = 25 sp.
6 species, not in Monogr. of 1864

La Clede Hotel
Sept - 13th

Dear Doctor -

I find that several of my friends are going to Hermann in the morning and they insist upon my going with them - As it will save some time for me I think I had better go and trust to luck for seeing Shaws Garden -

I therefore hope you will excuse me from my engagement with you in the morning & also excuse pencil -

Very Truly
Henry Thurber

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C. heterophylla Pursh
Callitriche Asa Gray
Hegelmaier 1864
C. verna Pursh Flor. Amer. ex parte Monogr. p. 54.

3-24

Austin first collect it in Jun 1842

eral of whom died, and
have been greater but for the kind attention of Dr. Evans, who, though himself laboring under an exhausting diarrhœa, allowed himself no rest, but in the triple capacity of physician, nurse and companion, was ever at the bed-side of the sick, administering to their wants, and encouraging them by his cheering words.

From Fort Pierre, Dr. Evans again visited the Mauvaises Terres, where in a short time he succeeded in obtaining a large collection of the fossil fauna of that region, even more extensive than his former one, and embracing a considerable number of new and interesting species. On his return to the Fort he set about preparing for his long journey, which from the hostility of the Blackfeet and other Indian tribes, together with the difficulties incident to the route, was regarded by the Indian traders as extremely hazardous; hence it was exceedingly difficult to find either guides or hunters willing to accompany him. After much persuasion, however, he succeeded in procuring the services of two hunters and a half-breed guide, they agreeing to go with him as far as the Flathead Village. With this meagre escort he started from Fort Pierre, but scarcely had he reached the borders of the Blackfeet country ere his hunters became alarmed, and unceremoniously left his camp during the night and returned to the Fort. Under these discouraging circumstances a person less courageous than Dr. Evans would have turned back; but difficulties served only to develope the indomitable

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* To Dr. Hiram A. Prout is justly due the credit of having first called attention to the existence of such remains in that region by his excellent memoirs of Palæotheroid and other bones, published in Silliman's Journal.

the highest value
ey was ordered.

September 2, 1861.

The President, Dr. ENGELMANN, in the chair.

Seven members present.

The following donation to the library was received: Bull. de la Soc. Imper. zool. d'Acclimatation, Paris, No. 7, Juillet, 1861, *from the Society.*

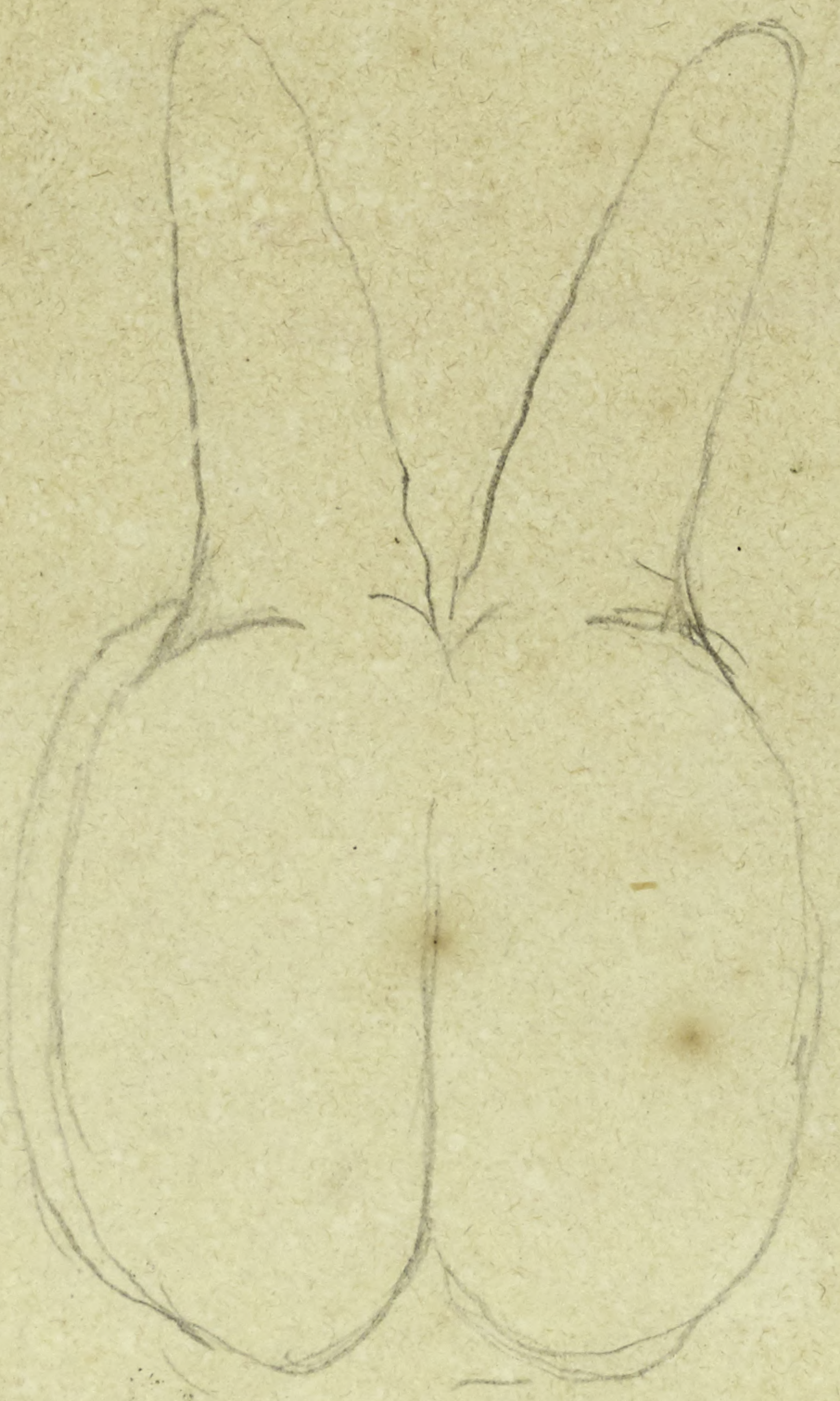
Mr. Holmes presented from Dr. B. F. Shumard the following skulls from Texas: *Felis pardalis*, Linn. (Tiger-cat), from Travis Co.; *Felis onza*, Linn. (Jaguar), from Hays Co., and *Dicotyles torquatus* (Peccary), from Travis Co.

Dr. Engelmann made some remarks on the temperature and humidity of the past three summer months. June and August were by more than two degrees warmer than the averages for these months, while July was cooler. The quantity of rain for each of these months was below the average

Call. heterophylla Jun 14 1865

796

submersa



x 150

no papillae seen

sterile stigma

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797

Pollen

Geyer St Louis	ellipt	0.024 – 0.027	×	0.020 – 0.024
	globos	0.025 – 0.026		
Hall Athens	globos	0.022 – 0.024		
Austin Palisades	"	0.020 – 0.022		
Bigelow Californ	"	0.023		

anthers, diamet

Geyer St Louis	0.7 mm
Hall Athens	0.7 – 0.8
Austin Palisades	0.7 – 0.8
Short Kentucky	1.0
Bigelow Californ	0.6 – 0.7

0 1 2 3 4 5 6 7 8 9 10
cm
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